



Open Technology Initiative's Proposal for the Design and Analysis of a Lifeline/Link Up Broadband Pilot Program

I. BACKGROUND

The Open Technology Initiative at New America Foundation (OTI) has substantial experience working with community organizations to evaluate digital literacy and broadband adoption programs. OTI uses a collaborative needs assessment and evaluation process based on the data that partners already collect about their programs and programmatic goals the partners want to accomplish. OTI currently serves as an evaluator for several projects that have received Broadband Technology and Opportunities Program (BTOP) grants. As a part of the Philadelphia Freedom Rings Partnership¹ and the Detroit Digital Justice Coalition², OTI evaluates partners' Sustainable Broadband Adoption (SBA) and Public Computer Center (PCC) projects. OTI has conducted comprehensive needs assessments with partners from the Philadelphia Freedom Rings Sustainable Broadband Adoption program and is currently conducting needs assessments with Public Computer Center partners.

OTI conducts regular extended interviews with each partner and reviews a comprehensive set of metrics to identify and gauge the effectiveness of partners' methods. Our aims in evaluation and documentation processes are: (1) to help partners understand and meet their goals in deploying community internet training and literacy; (2) to develop the questions they want to answer to prove their successes and address their challenges in deploying those trainings; (3) and to define the methodologies they want to deploy in getting the answers to those questions. Collecting data about how well partners meet their goals when they train clients is an integral part of our role in this project.

OTI's work with Measurement Lab is also a central tool in gathering data about internet use in several state-level Broadband Plans. Crowdsourced broadband data can be layered into other datasets. For example, in the case of the Partnership for a Connected Illinois maps³, the data can be used to analyze barriers to adoption and access. When used in conjunction with the qualitative data described above, a picture emerges of patterns of adoption and the social factors that may affect it.

¹ <http://www.freedomringspartnership.com/>

² <http://detroitdjic.org/>

³ <http://broadbandillinois.org/index.html>

How a collaborative needs assessment and evaluation process works

Our experience in facilitating a collaborative needs assessment and evaluation process has allowed us to synthesize some of the metrics that are effective in measuring the success of various approaches to sustainable adoption.

Our partners collect data from clients using a variety of instruments at different stages of the broadband trainings. Some partners use one form across all classes in a particular program, while others use more specific forms for each course and questions in these forms are focused towards collecting only course-specific information. The following is a list of partner assessment tools that we have seen used in BTOP program evaluations:

- 1) Intake Form** - During this stage, partners track questions on client demographics, technology and Internet adoption, and client interest in the program.
- 2) Pre-training Assessment Form** - During this stage, partners track client demographics, client skills ratings, client technology and internet experience and adoption, client interest in the program, and questions on digital literacy for the client and the client's community. This form helps partners tailor programs according to the participant or client knowledge profiles.
- 3) Post-training Assessment Form** - During this stage (i.e., after clients complete their training), partners continue to track client skills ratings, technology and Internet experience. Partners seek to understand how well clients have grasped the elements of the training. Partners are also interested in feedback about their training programs from the clients.
- 4) Course Evaluation Form** - Metrics tracked here relate to the clients' assessment of the effectiveness of learning objectives in particular courses.

Questions Relevant to a USF Broadband Pilot Study

OTI has identified questions from both the PCC and SBA data collection processes that could be useful for the Commission pilot program evaluation. The questions identified below are categorized into four interest areas: **modality, uses/learning/literacy, relevance, and satisfaction with the training.** As mentioned above and as is characteristic of collaboratively driven evaluation projects, OTI did not require partners ask these questions; program partners define their own questions as they related to the partners' existing missions. We categorized the questions after the fact. The advantage of this process is that not only are adoption questions and questions of other beneficial effects of broadband availability and use context-sensitive, they are also worded in ways that partners feel will best elicit responses from clients.

We have broken down the interest areas this way in order to capture more than simply time spent in training. Our interest is in observing how clients are using digital skills, and gauge whether the kinds of uses being learned are leading toward long-term, sustainable adoption that has positive impact on quality of life. “**Modality**” indicates how the kind of device being used to access the Internet

(computer, smartphone, etc.) affects the kinds of activities performed online. **“Use/learning”** informs about those activities, and the extent to which Internet use is benefiting clients. **“Relevance”** measures to what extent online users see Internet tools as useful in their lives, and how committed they are to continuing to use the Internet. **“Satisfaction”** allows us to measure how well the program is working, so that the coalition can adjust the system to be more effective for users.

Below, we have listed examples⁴ of these questions that best reflect each of those four areas of interest:

Modality

- Do you have a cell phone?
- Do you have a computer at home?
- Is your computer connected to the Internet at home?
- If you have Internet service at home, please say how you get your service.
- What is the condition of your home computer?
- What kind of connection do you have?
- Do you have Internet access on your phone?
- If there is a computer lab in your facility, have you used it?
- Do you use a computer lab outside of your home on a consistent basis weekly (example library, school, church, etc.)?
- If yes, where?
- Have you used the computer lab in the last 3 months?
- How many hours per week do you go there?
- If you do not have a computer now, have you owned one in the past?

Use/learning

- Can you access the Internet on your cellular phone?
- Do you text message on your cellular phone?
- How often do you use your computer at home?
- Have you searched for a job online in the last month?
- Have you used email in the last month?
- Do you see yourself able to pursue new job opportunities as a result of

⁴ These examples were drawn and categorized from a larger collection of questions posed by OTI’s BTOP partners to their BTOP clients as part of the BTOP evaluation process. These partners include: Urban Affairs Coalition, Media Mobilizing Project; The National Comprehensive Center for Fathers; One Day At A Time; The People’s Emergency Center; Philadelphia FIGHT; Tenant Support Services Incorporated, Drexel University, and the Community College of Philadelphia; and Youth Outreach

completing this training, or do you have new job opportunities coming up?

- I have a new email address thanks to this class.

Relevance

- How much can you pay for Internet access?
- To what extent do you agree with the statement, "The internet was made for me"?
- Of the people you know who don't use the Internet, what would you say are the three main reasons they don't?
- What would help you the most in improving your experience of the Internet?
- How much would you be willing to pay a month to get high speed Internet access that would allow you to download music/videos, email, or complete research?
- If you could have the same connection you have now for less money, or a faster connection for what you pay now, which would you choose?
- If you do not have Internet access, are you interested in getting it?
- Would you be interested in paying for Internet service for your home computer at a reduced cost?
- How likely are you to purchase a technology device: computer, laptop, smart phone, tablet etc?
- How likely are you to purchase Internet access or a data plan (etc.)?
- How much are you willing to pay?
- Of the skills and programs that we practiced, which are you most likely to apply to your day-to-day life?
- Do you believe that what you have learned in this program has potential to help you in your life?
- If we were to offer computer workshops in advanced skills, what topics would be of most interest to you?
- What impact has this program had, or will this program have, on you?

Satisfaction

- Did you get what you were expecting by completing the computer classes?
- What will you do with what you have learned?
- What impact has this program had, or will this program have, on you?
- I feel connected to my community. (yes / no)
- I think that my computer skills are important for my community. (yes / no)
- Describe challenges you have overcome to participate in these programs.

- Are you more satisfied or proud of yourself for completing this program?
- Do you believe that what you have learned in this program has potential to help you in your life?
- What next steps will you pursue in using or increasing your new computer and Internet skills?
- Are you interested in mentoring other new Internet and computer users to gain new technology skills?
- Do you see yourself able to pursue new job opportunities as a result of completing this training, or do you have new job opportunities coming up?

II. PROPOSED LIFELINE/LINK UP PILOT RESEARCH DESIGN

OTI believes that an open process for designing information collection, based on establishing and balancing priorities of the pilot project stakeholders, allows for the most productive and representative collection, study, use, and integration of data and conclusions.

- Baseline: It is first of all crucial to define what is being measured. Adoption has been targeted by FCC and NTIA as a goal due to its relationship to economic and community development. Thus we argue that community-wide impacts (not just individual adoption rates) of Lifeline/Linkup must be measured: how are people using the Internet (jobs, civic participation, education)?

To measure potential community impacts, the study should also be geospatially sited to allow demographic and economic indicators from other relevant datasets (census, transit routes, social and community services, community anchor institutions, County Business Patterns, American Community Survey, etc.) to be layered over broadband adoption patterns and used for analysis. Geographically rich data can help identify contextual factors that may affect adoption; for example, the siting of social services, anchor institutions, and public transit in relation to certain neighborhoods may affect the needs people have to access services over the Internet. A clearer picture of economic and social health in an area with many subscribers can also be gleaned from the use of multiple data sets.

- Definition of adoption: The Commission has defined broadband adoption in relation to a home subscription to broadband (Horrigan & FCC, 2010). However, the Commission's other research (Dailey *et al.*, 2010) suggests that home access may not be a reliable measure because obsolete equipment prevents meaningful use. For example, the problem of a broken or slow home computer or Internet connection impedes use, even when a household subscribes to the Internet. Dailey *et al.* (2010) also found that home access is just as important as access at public Internet centers. These centers serve as vital community-building spaces as well as safety nets against sudden or unexpected disruption in home service.

Preliminary evaluation instruments designed by BTOP partners in Philadelphia and Detroit also suggest that home adoption is not synonymous with broadband adoption due to the fact that a lack of skills and other barriers can preclude participants from using the internet in personally relevant ways. Thus, a community setting where individuals have access to digital literacy support often enables them to benefit more richly from connectivity. As a consequence, recipients of the Broadband Technology Opportunities Program have created adoption metrics that take note of specific community contexts, assets, or goals as well as individual user behavior, such as how Internet access relates to critical life skills. Preliminary evaluation instruments also suggest that quality of service issues also relate to broadband adoption.

- Study Design

- Key question: Related to our definition of broadband above, we suggest that the following research questions guide evaluation of the pilot study: Under what conditions does Lifeline/Linkup reach the populations most in need, and result in the most beneficial community-wide effects for those populations?
- Sampling method: We suggest that the Commission conducts a multi-sited study (either in multiple cities or in multiple sites across one city) to allow for control of demographic characteristics through census information while also enabling comparative analysis to control for multiple variables.

In addition, we suggest that FCC select representative samples from different geographical contexts (e.g., rural, urban, peri-urban⁵), in order to build case studies.

- Sample size: The Commission can conduct a series of nested studies⁶ of subsamples within the larger sample in order to measure impact and kinds of adoption that emerge with or without training programs and computer centers, and also as related to the kind of device (mobile or fixed) used by participants.

Within these nested studies, sample size should vary based on baseline information about broadband adoption in specific locales, as well as methodology.

Example 1 (Experimental research design): The Commission could design a simple 2 x 2 study on the effects of different equipment subsidy models. In this type of design, the sample size could remain relatively small provided that individuals were randomly assigned to

⁴ According to the Oxford English Dictionary, periurban refers to an “immediately adjoining city or conurbation.” In more colloquial terms, the term refers to urban sprawl.

⁵ Borgan, O., Goldstein, L., & Langholz, B. Methods for the analysis of sampled cohort data in the Cox proportional hazards model. *Annals of Statistics*, 23(5), 1749-1778.

different treatment conditions. In other nested samples, the Commission could study additional effects of pilot design and investigate the following hypotheses:

H1: The proximity and density of community anchor institutions increases the likelihood for individuals to benefit from a Lifeline/Link Up broadband program.

H2: The existence of a sufficiently funded enrollment campaign increases the likelihood for individuals to benefit from a Lifeline/Link Up broadband program.

H3: The provision of the highest bandwidth service increases the likelihood for individuals to benefit from a Lifeline/Link Up broadband program.

Example 2 (Qualitative case study): Quantitative analysis alone is not enough to measure adoption rates and patterns, especially given the variability of definitions of adoption. The Commission has already demonstrated its capacity to engage in such mixed methods, producing a qualitative study of low-income broadband adoption (Dailey *et al.* 2010) as well as a quantitative study of consumer broadband users (Horrigan & FCC, 2010). Similarly, for the Lifeline broadband pilot study, it should include qualitative study of broadband adoption as an additional nested study.

For example, the Commission could design a qualitative study that investigates the effectiveness of an enrollment campaign at a specific research site with the greatest hardship (e.g., low socioeconomic status, poor enrollment in the traditional Lifeline/Link Up programs). By studying effectiveness of enrollment in an in-depth manner, the Commission can begin to understand where, when, and how it can have the broadest impact on the neediest communities (Flyvbjerg, 2006). Alternately, the Commission could design a study that investigates home Internet use. Again selecting a research site that is characterized by the most challenging economic, social, and political constraints, the Commission can begin to understand the complex features of home broadband consumption (see Haddon, 2006).

Example 3 (Survey): Using a sample size that provides statistically significant results, a survey of eligible program recipients that judges their likelihood to engage in certain types of behaviors, from specific internet uses related to quality of life issues (finding a job, obtaining reliable health information, applying for a college loan, etc.) to likely behaviors (paying for a subscription to broadband at a certain price). We advise the Commission to offer a battery of questions that consider varying meanings of adoption (e.g., reflect the breadth of community-authored questions listed above that BTOP grant

recipients are asking clients). Note: Both survey work and experimental research design would allow the Commission to examine the counterfactual: i.e., eligible populations that are not being served by Lifeline/Link Up.

- Ethical study: The Commission should determine whether it will be required to seek Institutional Review Board approval for its study. To the extent that it can, the Commission should consult with community organizations or BTOP grant recipients to develop instruments for data-gathering that do not compromise privacy of pilot participants and yet collect sufficiently standardized data for quantitative analysis. For example, the Commission may be able to define terms of service agreements that would signal to Lifeline/Link Up pilot study participants that user data is being collected (see, for example, Hampton, 2010).

Based on our experience working with community partners at BTOP studies where OTI is an evaluating partner, we have found that data-gathering itself is a redundant process for many program participants, and sometimes that partners are reluctant to add another data-gathering process to their workload.

III. SPECIFIC ANALYTIC TOOLS

Our recommended study designs correspond to specific analytical tools for enabling a comprehensive evaluation of a USF pilot. These include:

- Isolating Relevant Variables: As in Study Design Example 1 above, the Commission could analyze the variance among variables of interest in a series of 2 x 2 nested studies. This design would allow the Commission to identify contextual factors that affect the success of broadband adoption programs, such as Community Anchor Institutions or training programs that supplement subscription programs; enrollment campaigns; or broadband speeds.
- Identifying Particularities, Maximizing Comparison: Per Study Design Example 2 above, given the variety of variables affecting adoption and the variable definition of “adoption” itself, we highly recommend the collection of qualitative as well as quantitative data. A case study analysis should be written in a way that explains the complex historical or contextual reasons for enrollment or adoption particularities, while at the same time evaluating comparability to other digital inclusion programs or past USF programs.

Overall, we envision the Commission would be able to produce a series of studies that resemble public health research that examines the delivery of services (e.g., distribution of a vaccine). The field of public health uses not only field experiments but also qualitative case study and survey work to evaluate effectiveness of a public health program. Similarly, the Commission can offer a richly textured understanding of the effectiveness of a pilot USF program through multiple methodological angles.

Finally, we urge the Commission to ensure that it make available raw data and specify its methodology and statistical analysis methods to the public in order to permit replication of its studies by the research community.

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